

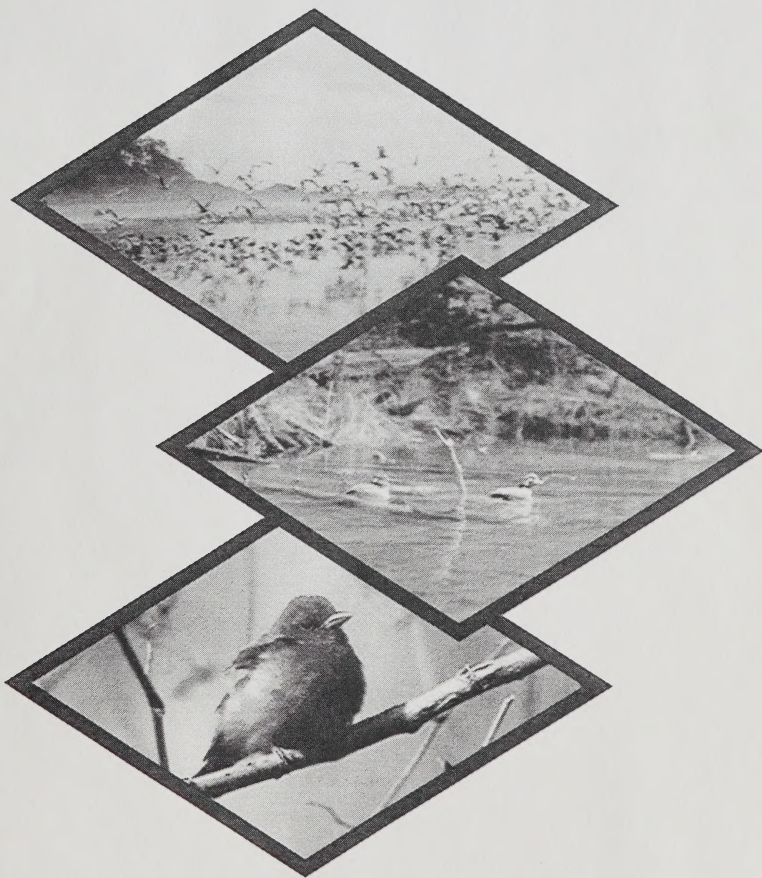
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Migratory birds environmental assessment guideline

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Biodiversity Protection Branch
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Environment Canada

1998

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- ❖ *Environmental assessment guideline for forest habitat of migratory birds*

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Published by Authority of the Minister of Environment
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Cat. No. CW66-173/1998
ISBN: 0-662-63740-2

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Introduction

The following guideline has been developed to identify for proponents of projects the types of information and analyses that Environment Canada would expect in the section of an Environmental Impact Statement (EIS) that deals with impacts on migratory birds. It was developed to promote best practices for environmental assessments under the *Canadian Environmental Assessment Act* (CEAA), or when Environment Canada is involved in an environmental assessment of another jurisdiction. It is also envisioned that its broader use will facilitate a more standardized approach across Canada to assessing environmental impacts on migratory birds.

This guideline is predominantly conceptual in its approach, focusing on principles, rather than providing a detailed checklist of information and analytical requirements for the EIS. It focuses on requirements for migratory birds, which may not necessarily be consistent with the habitat needs for other wildlife. Environment Canada recognizes that a balance in obtaining the broader biodiversity and sustainable development goals will be the outcome of an environmental assessment. Further, it is recognized that all the information identified in this guideline may not be readily available nor applicable to all projects, but in attempting to achieve best practices in environmental assessment it is necessary to identify state-of-the-art approaches to information requirements and impact analyses. Information requests for EISs will therefore change through time as new information becomes available, and science, environmental circumstances, and environmental assessment practices change. Therefore, the guideline should not be regarded as either exhaustive or restrictive, nor would it preclude requests for additional or different information for a particular project.



Background

The importance and vulnerability of migratory birds was recognized nationally and internationally as early as 1916 with the signing of the *Migratory Birds Convention* between Canada and the United States. Since then, and particularly in more recent years, conservation or monitoring programs for all types of migratory birds in Canada have been developed. For example, waterfowl of conservation concern are addressed under the North American Waterfowl Management Plan, important sites for shorebirds are identified through the Western Hemisphere Shorebird Reserve Network, seabirds of concern have species-specific conservation and management plans, and landbirds are currently being addressed under the Canadian Landbird Conservation Program (also known as Partners in Flight — Canada).

Despite these programs, pressures on migratory bird populations and their habitat continue. Careful planning of projects can reduce these pressures. In particular, environmental assessment offers an opportunity to assess the potential environmental effects of proposed projects on migratory birds so that informed decisions can be taken that result in the least disruption to these birds and their habitats.

The *Migratory Birds Convention* of 1916, which was implemented by the *Migratory Bird Convention Act* (MBCA) in 1917, provides for cooperation between Canada and the United States in the protection and management of migratory birds. A 1995 protocol to amend the *Migratory Birds Convention* between Canada and the United States emphasizes the need to provide for and protect necessary habitat for the

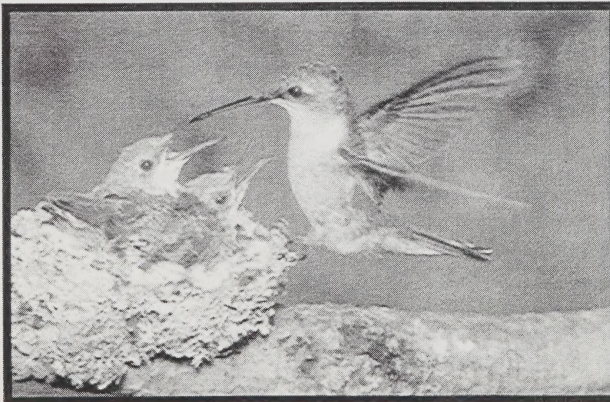


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conservation of migratory birds. This is consistent with existing approaches, such as the establishment of Migratory Bird Sanctuaries pursuant to the MBCA and National Wildlife Areas pursuant to the *Canada Wildlife Act* (CWA). The CWA also provides for coordination of wildlife programs and policies that involve birds not protected under the MBCA.

Maintaining healthy migratory bird populations and diversity requires an ecosystem management approach that considers the interrelationships among wildlife, habitats, and human activities. Several international and Canadian resource management policies are based on an ecosystem approach. For example, the *United Nations Convention on Biological Diversity* and the *Canadian Biodiversity Strategy* commit Canada to the conservation of biological diversity (including ecosystems) and sustainable use of biological resources. *A Wildlife Policy for Canada* defines wildlife as all wild organisms and their habitat. Together, they address the need for integrated approaches to maintaining populations of wild species, biodiversity, and habitat, while maintaining human activities.

The *Convention on Biological Diversity* specifically addresses the application of environmental assessment to biodiversity. It identifies environmental assessment as a process that will help to ensure that proposed projects are undertaken with a “view to avoiding or minimizing” significant adverse effects on biological diversity. The *Canadian Biodiversity Strategy* echoes the need for the use of environmental assessments to determine potential environmental effects on biodiversity, including ecosystems.

In recognition of the need for an ecosystem management approach to correctly address the needs of migratory birds while balancing the need for sustainable development, this guideline focuses on a habitat approach to incorporating migratory bird concerns into environmental assessments.



Information requirements

This section describes both the contextual and specific information requirements that should be included in an EIS addressing potential environmental effects of a project on migratory birds.

1. Context

The environmental assessment should be conducted in an ecosystem context. Although ecosystems are dynamic in nature and changes are often the result of normal ecological processes, projects often cause changes outside the realm of natural variation, often at accelerated rates. As a result, the quality of birds' habitats or avian behaviour (such as selection/use of traditional staging areas) can be affected. Too radical changes could ultimately influence the survival of migratory birds. Therefore, baseline information needs and potential environmental effects of a proposed project should be determined by examining the likely effect of the proposed project on the migratory birds, the ecosystem (particularly their habitat), and the linkages between them.

Quantification of information provides the basis for more accurate prediction of impacts and selection of mitigation measures, and facilitates objective monitoring. Therefore, during the planning and execution of an environmental assessment, particular attention should be paid to the collection and presentation of good, scientific baseline data where parameters that could be affected by the proposed project are quantified.

Disturbance to critical habitats can lead to significant adverse environmental effects. Therefore, when gathering or compiling baseline

information, proponents of projects should give special consideration to information related to the critical habitat requirements of any species of migratory bird. These requirements will vary according to the species and its specific life-history strategies and behavioural characteristics. For example, old trees and snags may be a critical habitat requirement for cavity-nesting birds; whereas an undisturbed mud flat may be a critical habitat requirement for migrating shorebirds. Qualitative aspects of habitat may also be important, for example, poor water quality or contamination of food sources can lead to reproductive impairments for some waterfowl species.

The preservation of habitat is necessary for the maintenance of migratory bird populations. However, preservation of habitat *per se* does not guarantee an absence of impact. Depending on the individual or species, disturbances (such as human presence, noise, and light) can also affect the utility of otherwise sound habitat and should be considered in the impact analysis. For example, disturbance in a traditional staging area can deter feeding by migratory birds, which is necessary if they are to replenish their energy reserves prior to migration.

In many situations the effects of a project on habitat can provide a surrogate measure of the effects of a proposed project on migratory birds. The state of habitat can serve as an indication of the "health" (e.g., abundance and diversity) of migratory bird populations in an impact area. This may facilitate impact assessment for proponents, because focusing on habitat will allow for reasonable impact prediction at times when it is difficult to collect



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adequate data on migratory birds themselves. Consequently, in this guideline many of the considerations used to assess environmental effects on migratory birds focus on habitat, although other considerations may be equally or more important.

2. Priority species/areas

When providing information, proponents should give particular, but not exclusive, consideration to migratory birds or habitat that meet one of the following criteria:

- species listed or under review by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (COSEWIC species list updates can be obtained from the Canadian Wildlife Service) or species-at-risk listings in other jurisdictions;
- areas of concentration of migratory birds, such as breeding areas, colonies, spring and fall staging areas, and wintering areas;
- breeding and nesting areas of species low in number and high in the food chain (e.g., eagles, osprey);
- species that are identified by priority ranking systems¹; or
- habitats in or near areas that have been or are in the process of being identified by land managers as particularly important to the survival of the species globally, regionally, or locally, or habitats valued by local users of the resource. These include, but are not limited to, areas with the following existing, proposed, or potential² designations:
 - Migratory Bird Sanctuaries
 - National Wildlife Areas

¹ Except for those affected by natural evolutionary processes or living at the edge of their range, priority species are generally good indicators of present and past disturbances to migratory birds and their habitats. These disturbances could have occurred either locally or in distant wintering sites that may or may not be affected by the proposed project. Priority species require specific attention in the environmental assessment to ensure avoidance, minimization, and mitigation of impacts. For example, the Canadian Wildlife Service has developed a preliminary priority ranking, and a means for assessing importance of a given region to landbirds (Dunn 1997). In some provinces, Conservation Data Centres have also developed ranking systems. With respect to seabirds, the status of populations has been assessed; also for shorebirds, a preliminary assessment of the status of populations in Canada has been completed. Priority waterfowl are identified in regulations and/or given priority under the North American Waterfowl Management Plan (NAWMP). The proponent should consult the environmental assessment practitioner in the relevant regional offices of the Environmental Conservation Service of Environment Canada to identify priority species.

² Sites that may potentially be so designated are best identified by local managers of wildlife and land.

- Western Hemisphere Shorebird Reserve Network sites
- Ramsar (Convention on Wetlands of International Importance Especially as Waterfowl Habitat, or Ramsar Convention) sites
- Important Bird Areas (IBA), and
- National Parks and other types of protected areas that have been established, in part, to protect migratory birds and their habitat

3. Specific information

Specific information requested for migratory birds will depend, in part, on the scale of the proposed project or activity and the projected degree of impact. For example, the significance of the impact is viewed as higher if priority species or critical habitat used by birds could be affected. The regional environmental assessment practitioner of the Environmental Conservation Service of Environment Canada (ECS/EC) can provide guidance on how to obtain the specific information required and may be able to identify information sources to assist in carrying out the environmental assessment. The information identified below is generally required for an understanding of the potential impacts of a proposed project.

- A complete project description including engineering details should be provided. This information should be provided or discussed at the earliest stage of planning to allow for modification of the project design prior to major commitments by the proponent.
- The geographic boundaries of the environmental effects of the proposed project must be identified (referred to hereafter as the “impact area”). The boundaries should encompass the geographic extent of the ecological processes and ecosystem components that would be affected by the project and that could potentially affect migratory birds or their habitat. Effects to consider are the mobile nature of migratory birds, their varied habitat requirements (e.g., foraging, nesting, and staging habitats), and the seasonal use of habitats. It is critical that the boundaries of the impact area be agreed to by the proponent and environmental assessment practitioners early in the planning stage.
- A description of the potentially affected impact area will be required. The description should address the terrain, biological settings, and land use in the area. Particular attention should be paid to habitat requirements of the migratory birds in the impact area.
- Maps or GIS systems that accurately locate the impact area and baseline information should be provided at the same scale as the engineering plans to allow for overlaying of maps. Maps should contain UTM coordinates or other identifying parameters.
- Species of migratory birds likely to be affected by the proposed project should be identified along with their seasonal occurrence, relative or absolute abundance, and population trends.
- The distribution of the species in the impact area with respect to habitat types (i.e., nesting, staging, feeding, winter habitat) should be identified. Any variation in habitat use due to seasonality, or climatic or other conditions should also be described.
- If the potential impact area is an area of particular importance to migratory birds (e.g., containing a high abundance, high diversity, priority species, or species at risk) in any season, or if it could potentially be an area of importance during periods of environmental stress (e.g., drought), then it should be identified and described. The abundance and diversity of habitats important to migratory birds relative to other elements in the regional landscape should be quantified.
- The habitat types expected to be affected by the proposed project should be described. The

critical habitat requirements of priority species should be described.

- Any known or hypothesized minimal area requirements for any of the species that could be affected by the proposed project should be described.
- Any species or subspecies in the impact area for which there may be special genetic considerations should be identified: for example, a species at the edge of its range or a subpopulation that winters in different locales than the rest of the population. The genetic considerations should be described.
- Species in the impact area that have limited abundance outside the impact area should be identified. The reasons for this specificity to, or particular abundance in, the impact area should be described. For example, is it the result of biogeographic considerations or previous changes or impacts in the regional landscape outside the impact area? Species with high abundance in the impact area should also be identified.
- The proponent should describe the relative abundance and use of migratory bird habitats in the impact area compared to similar habitats in the regional landscape that will not be affected by the proposed project. (This identifies the uniqueness and relative use of the habitat regionally and identifies potential control sites for monitoring environmental effects.)
- If the impact area is known to be habitat for successfully breeding sensitive species or to have the characteristics of such a site, this should be identified. This is particularly important for landbirds in landscapes that have a relatively high degree of fragmentation.
- When identifying migratory birds and habitat that could be affected and for which information is provided, the food sources and/or feeding areas for migratory birds that could be disrupted by the proposed project should be identified.
- The degree of confidence in the accuracy of the information that is presented in the EIS should be described. Ground truthing may be required (see Monitoring section).



Environmental effects

1. General considerations

A careful assessment of the environmental effects of the proposed project should be undertaken prior to consideration of any mitigation. The extent, both spatial and temporal, and the degree, quantified where possible, of the effects should be outlined in the environmental effects section of the EIS.

The types of factors that contribute to environmental effects will vary depending on the project and the types of habitats that are potentially affected. Additionally, the effects will depend on the intensity, duration, timing, and frequency of impacts. Cumulative effects should also be considered (see Cumulative Effects section). All the above should be incorporated into the impact analysis in view of the habitat needs and population dynamics of potentially affected species.

The baseline information needs that were identified in the previous section identify the parameters and ecological concepts that should be considered in the impact analysis. As in the baseline information section, the specific focus of the environmental effects section of the environmental assessment should be on maintaining viable habitats — especially sites with high concentrations of migratory birds, priority species, COSEWIC-listed species, and other species at risk.

If the proponent undertakes to classify the effects (e.g., as negligible, minor, major or significant, and either positive or negative), then explanations and justifications for the ranking system and designation of impacts should be presented. Quantification of environmental effects provides a good basis for determining the degree of impact. In particular,

comparison to similar migratory bird habitats in the same or nearby similar landscape provides an opportunity to examine effects in a relative manner (see Monitoring section).

When considering potential impacts on habitat, include the degree of fragmentation/connectivity expected from the proposed project relative to the degree before the proposed project. This assessment should address fragmentation/connectivity within and between habitat types (e.g., within nesting habitat or between nesting and feeding habitat).

Consideration should also be given to habitat modifications that appear beneficial. Care should be taken to ensure that large-scale diversity is not reduced by local changes and that priority species are not negatively affected. For example, forest fragmentation can increase diversity at a local level but reduce diversity at a larger scale; it can also reduce abundance of priority species that require interior forest habitat. Similarly, although removal of one type of habitat may result in the creation of another type of habitat (for example, during hay-making), the change should not be considered beneficial if the replacement habitat supports smaller populations of priority species.

2. Specific considerations

Environmental effects, whether direct impacts or due to the modification of habitat, should:

- be considered at individual species and community levels;
- consider any potential increase in competition with other species of birds or other animals as a result of habitat change;

- consider increased potential for predation or brood parasitism; and
- consider any quantitative or qualitative (e.g., contaminants, species shifts) changes to food sources.

When determining impacts, proponents should consider disturbances, such as:

- noise (i.e., frequency, duration, and intensity);
- structures that could become obstructions (e.g., hydro towers and lines);
- visual changes (e.g., lighting); and
- use by humans.

Proponents should determine impacts on the following:

- abundance;
- density;
- distribution; and
- reproductive success of migratory birds.

The effects on Aboriginal or local subsistence users of migratory birds should be considered.

The degree of confidence with which these impacts can be accurately predicted throughout the EIS should be described.

3. Cumulative effects

CEAA specifically requires an environmental assessment to consider the cumulative environmental effects of a project. These are effects

that are likely to result from the project in combination with other projects or activities that have been or will be carried out. (CEAA ss.16(1)(a)).

Because cumulative effects encompass changes resulting from past, proposed, and potential future projects, proponents need to take the dynamic nature of ecosystems into consideration. More specifically, the baseline information should describe the environment without any development, and elucidate and quantify the natural changes inherent in ecosystems. For previously developed locations, the use of unmodified control sites may provide approximate baseline information.

In many cases, migratory bird populations and their habitats have already been affected by human activities, locally, regionally, nationally, and internationally. An understanding of how the

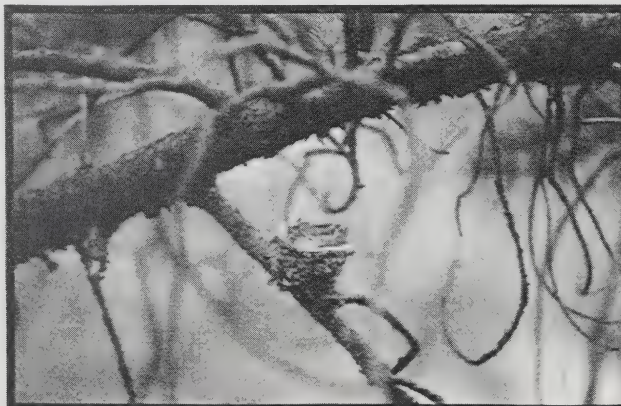


Photo: Robert Milko

population responded to stresses in the past may be useful in the prediction of the effects of a particular stress associated with the proposed project. However, some species may have threshold population levels below which reproductive capacity and immigration are not able to overcome stresses from adverse environmental effects. These considerations should be addressed in the cumulative effects section of the EIS.

4. Mitigation

Mitigation is defined by CEAA as follows:

“mitigation” means, in respect of a project, the elimination, reduction or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.

The basic premise for any mitigation technique or strategy should be avoidance. The proponent should carefully consider the need for any component of the project that would affect migratory birds or their habitat. Relocating a project may provide the least disruptive approach. Consideration should be given to the timing of construction and/or project activities that contribute to disturbance. Activities should be avoided during critical periods of the migratory birds’ life cycles (e.g., nesting, staging). Failing adequate avoidance, mitigation techniques and strategies should focus on minimization of impacts.

Mitigation should be considered for each of the environmental effects predicted in the previous section. Although addressing each environmental effect individually is a good starting point, an understanding of mitigation techniques or strategies that take into consideration the complex nature of ecosystems is required. For example, although use of a nonnative species in restoration may provide some habitat characteristics, such as food, it may negatively affect the natural ecological balance in the community. Consideration should be given to

the effects of the technique on nontarget species and their habitat. Care should also be taken to ensure that mitigation for migratory bird species does not compromise other wildlife, or that mitigation for effects on other wildlife does not compromise migratory birds, important ecosystem components, or ecological processes.

The expected degree of effectiveness of proposed mitigation techniques or strategies should be identified and explained.

5. Residual effects

The proponent should describe what environmental effects would remain after mitigative measures have been conducted. If attempts are made by the proponent to classify the effects (e.g., as negligible, minor, major, or significant), explanations and justifications for the designation of impacts should be presented.

Particular attention should be paid to residual effects because they play a large role in the determination of whether the adverse environmental effects are acceptable or are significant enough to require mediation, panel review, or nonapproval.

6. Monitoring

Monitoring regimes are needed to determine whether impacts are more than predicted, and to allow for appropriate changes in mitigative measures, if they are required. The proponent should describe proposed monitoring methods. Generally, they should conform to accepted monitoring practices for the different bird types, but particular methods may be requested by Environment Canada, depending on the specific situation and species in the impact area.

When using habitat as an indicator, proponents should conduct ground truthing to ensure that habitat monitoring is a reliable way to track changes in migratory bird abundance and diversity as

predicted in the EIS. The amount and detail of the ground truthing required will depend on the project and its projected impacts.

Monitoring, in general, should be conducted at specified intervals to determine the range of variation. To determine which effects are the result of the project and which are the result of natural variation, proponents are encouraged to monitor control sites that contain habitats and migratory bird populations similar to those found in the proposed impact area.

Monitoring requirements may be imposed as a condition of project approval.

7. Methods

It is beyond the scope of this guideline to identify methods of collecting information. There are standardized, quantitative data collection techniques for different bird types and species, as well as habitat description methodologies. The methods to employ will vary depending on the bird species, season, habitat type, and purpose of the data collection, which may be in part determined by the type of project and predicted impacts. Use of standardized techniques provides for the collection of data that will be comparable to other regional or national data, which in the long term will provide a more comprehensive database for more accurate impact predictions.

The EIS should clearly indicate the method used to collect the data and any existing information sources that were used in its preparation. The proponent may be required to justify the methods chosen. For all the above reasons, the proponent is encouraged to consult with the regional environmental assessment practitioner to determine what data may already be available and to discuss appropriate methods for data collection.



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